



Dart Aerospace Ltd.
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D407-667-105TRN
Job Sheet 196123



Part No: D407-667-105TRN

Job Qty: 1 pcs

Part Name: Crosstube Turning Detail



Part Weight: 0 lbs

Status: New

Priority: Medium

Job Created: 6/7/19

Job Tracking No:

Due Date: 6/17/19

Created By: Marie Lajeunesse

Type: Stock

Description:

Note: DWG D407-667-145 REV.D IPP Rev:a 08.02.28 new issue EC IPP Rev B 08.04.02 Removed polish EC verified by: DD

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Lead Time	Sign-off
					Setup Hrs	Run Hrs	Workcenter / Supplier			
100	Mori Seiki TL-40 - 1	1 pcs	6/17/19	6/17/19	1.00	1.25	Mori Seiki TL-40 - 1			DAS 66 9-89 2019/06/30
110	QC 2	1 pcs	6/17/19	6/17/19	0.00	0.00	QC 2 - 1			
							QC 2 - 12			
							QC 2 - 14			
							QC 2 - 17			
							QC 2 - 19			
							QC 2 - 2			
							QC 2 - 20			
							QC 2 - 22			
							QC 2 - 23			
							QC 2 - 25			
							QC 2 - 32			
							QC 2 - 33			
							QC 2 - 35			
							QC 2 - 39			
							QC 2 - 4			
							QC 2 - 40			
							QC 2 - 44			
							QC 2 - 45			
							QC 2 - 48			
							QC 2 - 49			
							QC 2 - 50			
							QC 2 - 51			
							QC 2 - 52			
							QC 2 - 57			
							QC 2 - 62			
							QC 2 - 63			
							QC 2 - 8			DAS 66 9-89 2019/06/30
							QC 2 - 66			
							QC 2 - 64			

Plex 6/7/19 7:56 AM Dart.lajeunesse.marie

					QC 2 - 65	
					QC 2 - 5	
					QC 2 - 71	
					QC 2 - 73	
					QC 2 - 69	
120	Mori Seiki TL-40 - 1 - B4B	1 pcs	6/17/19	1.00 1.12	Mori Seiki TL-40 - 1 - B4B	DAS 662019/09/03 9-89
130	QC 2	1 pcs	6/17/19	0.00 0.00	QC 2 - 1	
					QC 2 - 12	
					QC 2 - 14	
					QC 2 - 17	
					QC 2 - 19	
					QC 2 - 2	
					QC 2 - 20	
					QC 2 - 22	
					QC 2 - 23	
					QC 2 - 25	
					QC 2 - 32	
					QC 2 - 33	
					QC 2 - 35	
					QC 2 - 39	
					QC 2 - 4	
					QC 2 - 40	
					QC 2 - 44	
					QC 2 - 45	
					QC 2 - 48	
					QC 2 - 49	
					QC 2 - 50	
					QC 2 - 51	
					QC 2 - 52	
					QC 2 - 57	
					QC 2 - 62	
					QC 2 - 63	
					QC 2 - 8	DAS 662019/09/03 9-89
					QC 2 - 66	
					QC 2 - 64	
					QC 2 - 65	
					QC 2 - 5	
					QC 2 - 71	
					QC 2 - 73	
					QC 2 - 69	
140	QC 8	1 pcs	6/17/19	0.00 0.00	QC 8 - 12	
					QC 8 - 14	
					QC 8 - 17	
					QC 8 - 20	
					QC 8 - 25	
					QC 8 - 3	
					QC 8 - 32	
					QC 8 - 33	
					QC 8 - 35	
					QC 8 - 39	
					QC 8 - 4	
					QC 8 - 44	
					QC 8 - 45	
					QC 8 - 49	
					QC 8 - 58	
					QC 8 - 8	
					QC 8 - 9	
					QC 8 - 68	
					QC 8 - 67	

				QC 8 - 1 (A)	
				QC 8 - 47	DAS
				QC 8 - 40	76
				QC 8 - 52	9-89
				QC 8 - 23	
				QC 8 - 57	
145 Crosstubes - 2 - B4B	1 pcs	6/17/19	0.00 0.36	Crosstubes - 1 - B4B	
				Crosstubes - 2 - B4B	BB 10/1/2019
				Crosstubes - 3 - B4B	
				Crosstubes - 4 - B4B	
150 Crosstubes - 3 - B4B	1 pcs	6/17/19	0.00 0.40	Crosstubes - 1 - B4B	
				Crosstubes - 2 - B4B	
				Crosstubes - 3 - B4B	NOV 01 2019
				Crosstubes - 4 - B4B	
160 QC 7	1 pcs	6/17/19	0.00 0.00	QC 7 - 10	
				QC 7 - 13	
				QC 7 - 14	
				QC 7 - 15	
				QC 7 - 17	
				QC 7 - 18	
				QC 7 - 19	
				QC 7 - 2	
				QC 7 - 28	
				QC 7 - 3	
				QC 7 - 30	
				QC 7 - 34	
				QC 7 - 36	
				QC 7 - 37	
				QC 7 - 41	
				QC 7 - 47	
				QC 7 - 48	
				QC 7 - 51	
				QC 7 - 58	
				QC 7 - 59	
				QC 7 - 60	
				QC 7 - 9	
				QC 7 - 68	
				QC 7 - 50	DAS
				QC 7 - 67	76
				QC 7 - 40	9-89
				QC 7 - 24	
				QC 7 - 43	
170 Packaging 3-1 - Stock - B4B	1 pcs	6/17/19	0.00 0.00	Packaging 3 - 1 - B4B	
				Packaging 3 - 2 - B4B	
				Packaging 3 - 3 - B4B	
				Packaging 3 - 4 - B4B	
				Packaging 3 - 5 - B4B	
				Packaging 3 - 6 - B4B	
				Packaging 3 - 7 - B4B	
				Packaging 3 - 8 - B4B	
				Packaging 3 - 9 - B4B	
				Packaging 3 - 10 - B4B	
				Packaging 3 - 11 - B4B	
				Packaging 3 - 12 - B4B	
				Packaging 3 - 13 - B4B	
				Packaging 3 - 14 - B4B	
				Packaging 3 - 15 - B4B	
				Packaging 3 - 16 - B4B	
				Packaging 3 - 17 - B4B	

6/7/2019

[Dart Hawkesbury] Job Sheet - Lajeunesse, Marie

				Packaging 3 - 18 - B4B	
				Packaging 3 - 19 - B4B	
				Packaging 3 - 20 - B4B	
				Packaging 3 - 21 - B4B	
				Packaging 3 - 22 - B4B	
				Packaging 3 - 23 - B4B	
				Packaging 3 - 24 - B4B	B3 11/11/2019
				Packaging 3 - 25 - B4B	
				Packaging 3 - 26 - B4B	
				Packaging 3 - 27 - B4B	
				Packaging 3 - 28 - B4B	
				Packaging 3 - 29 - B4B	
				Packaging 3 - 30 - B4B	
				Packaging 3 - 31 - B4B	
				Packaging 3 - 32 - B4B	
				Packaging 3 - 33 - B4B	
				Packaging 3 - 34 - B4B	
				Packaging 3 - 35 - B4B	
				Packaging 3 - 36 - B4B	
180 QC 21 - SA	1 pcs	6/17/19	0.00 0.00	QC 21 - SA - 21	NOV 11 2019
				QC 21 - SA - 70	
				QC 21 - SA - 53	

Part Op 100 - 1- Fill tube with sand & install plugs 407-105 on both ends as per Folio FA249 2- Turn both side of tube 3- Turn first
 Descriptions: taper section on both side as per folio FA249
 110 - (QC2- Inspect parts off machine FAI/FAIB)
 120 - 1- Turn second taper on both side 4- Scribe part # and batch # using vibrating stylus on the cuff as per Dwg D407-667-145 5- Ultra sound the crosstube as per FAI. "wall thickness mesurment" at given location.
 130 - (QC2- Inspect parts off machine FAI/FAIB)
 140 - (QC8- Inspect parts - second check)
 145 - GRIND ONLY TRANSITION LINES SMOOTH LONGITUDE WAY.
 150 - 1- handfinish X-TUBE INSIDE AND OUT
 160 - (QC7-Inspect Chemical Conversion Coat)
 170 - (Identify as per dwg & Stock Location:) LOCATION : LG014
 180 - (QC21- Final Inspection - Work Order Release)

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
D6010-115	Crosstube Material	1 pcs (1 ea)	100-Mori Seiki TL-40 - 1	E123975

Job Allocations

Operation	Component Part	Required	Inventory	Allocated
100-Mori Seiki TL-40 - 1	D6010-115	1	110	0

Part Specifications

Specifications could not be found.



Container No: S210449



Part: D407 - 667 - 105TRN

Job No: 196123

Serial No/Batch: S210449

Revision: D

Inspector:

Exp Date:

Instructions:

Dart Aerospace Ltd.
 1270 Aberdeen Street
 Hawkesbury, ON K84 1K7
 CANADA
 TEL.: 1 813 632-6200
 Email: sales@dartaero.com
 www.dartaerospace.com

Date: 08/30/19

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DART AEROSPACE LTD	Work Order: 196123
Description: Crosstube Assembly	Part Number: D407-667-145
Inspection Dwg: D407-667-145 Rev: D	Page 1 of 2

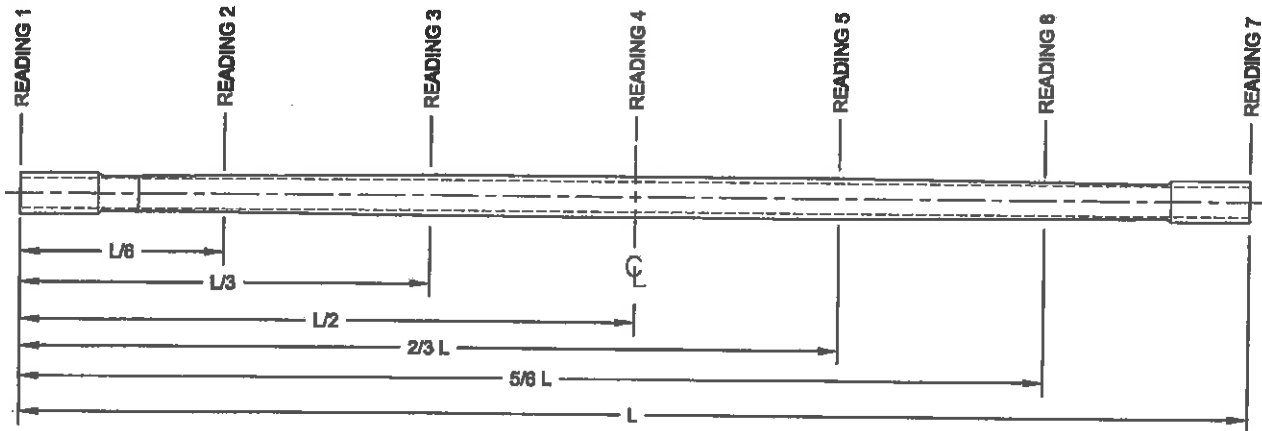
FIRST ARTICLE INSPECTION CHECKLIST

Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.240	+0.005/-0.000	2.240	✓		
	1.865	+0.005/-0.000	1.869	✓		
	1.878	+0.005/-0.000	1.882	✓		
	1.970	+0.005/-0.000	1.974	✓		
	2.030	+0.005/-0.000	2.035	✓		
	2.165	+0.005/-0.000	2.169	✓		
	0.125	+/-0.010	.122	✓		
	R0.063	+/-0.010	.063	✓		
	R0.500	+/-0.010	.500	✓		
	R0.063	+/-0.010	.063	✓		
SIDE B	4.438	+/-0.030	4.433	✓		
	2.240	+0.005/-0.000	2.240	✓		
	1.865	+0.005/-0.000	1.870	✓		
	1.878	+0.005/-0.000	1.882	✓		
	1.970	+0.005/-0.000	1.974	✓		
	2.030	+0.005/-0.000	2.035	✓		
	2.165	+0.005/-0.000	2.170	✓		
	0.125	+/-0.010	.120	✓		
	R0.063	+/-0.010	.063	✓		
	R0.500	+/-0.010	.500	✓		
	R0.063	+/-0.010	.063	✓		
	4.438	+/-0.030	4.442	✓		
	113.20	+/-0.020	113.20	✓		

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DART AEROSPACE LTD	Work Order:	196123
Description: Crosstube Assembly	Part Number:	D407-667-145
Inspection Dwg: D407-667-145 Rev: D		Page 2 of 2

WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation Δw (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L= 0"	318	314	298	298	.020	0.042"
READING 2 L= 18.867	165	171	171	162	.009	
READING 3 L= 37.734	263	266	261	257	.009	
READING 4 L= 56.700	311	311	317	311	.006	
READING 5 L= 75.467	266	263	258	259	.008	
READING 6 L= 94.333	170	165	161	165	.009	
READING 7 L= 113.20	307	310	304	307	.006	

Calibration Result

Actual Block Thickness: 100-500

Sitescan 250 Measured Thickness: 100-500

Measured by:	DAS 66 9-89	Audited by:	DAS 76 9-89	Preliminary Approval:	
Date:	2019/09/03	Date:	9-89	Date:	

Rev	Date	Change	Revised by	Approved
C	09.06.11	Dwg Rev updated	KJ	
D	11.06.21	Tolerance revised for 4.438 dimension	KJ	
E	12.06.04	Wall thickness form added	KJ	
F	19.03.27	Dwg Rev updated	MC	

Item	Qty	Part Number	Description
1	-145		
1	X	D407-887-145	CROSSTUBE ASSEMBLY (407 HIGH FWD)
2	1	D6010-115	CROSSTUBE
3	2	D2873-043	NUT PLATE
4	2	D2873-045	NUT PLATE
5	2	D2891-1	SUPPORT
6	4	D3595-063-395	RUBBER CUSHION
7	4	MS21920-20	CLAMP (OR MS21920-21)
8	14	MS20801AD4W10	RIVET (OR NAS8302B-4-10)
9	AR	PROSEAL 880 B-2	SEALANT, AMS-S-8802 CLASS B-2
10	2	AN742D38	CLAMP
11	2	MS9168-06	ANGLE BRACKET
12	2	MS21042L3	NUT (OR MS21042-3)
13	2	MS27038-1-08	SCREW
14	4	NAS1149C0332R	WASHER (OR AN890C10L)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6010-115
FINISHED LENGTH = 113.20±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D407-887-145" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 17.8 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) TO INSTALL D2891-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 880 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 13) INSTALL MS21920-20 CLAMPS (OR -21) WITH D3595-063-395 RUBBER CUSHIONS TO SECURE THE D2891-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMP MECHANISMS ARE LOCATED ON CROSSTUBE SUPPORTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 880 SEALANT HAS CURED FOR 72 HOURS.
- 16) MASK AREA UNDER CLAMP PRIOR TO PAINTING.
- 17) SEAL EDGES WHERE AN742D38 CLAMP MEETS WITH THE CROSSTUBE USING SIKAFLEX-2411 -291 OR MS-S-8802 CLASS B2 OR PROSEAL 880 SEALANT.
- 18) PERFORM RESISTANCE CHECK TO ENSURE MAX RESISTANCE IS 10 MILLION LBS.

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WITHOUT NOTICE

WORK ORDER

NO. 196173 MLS

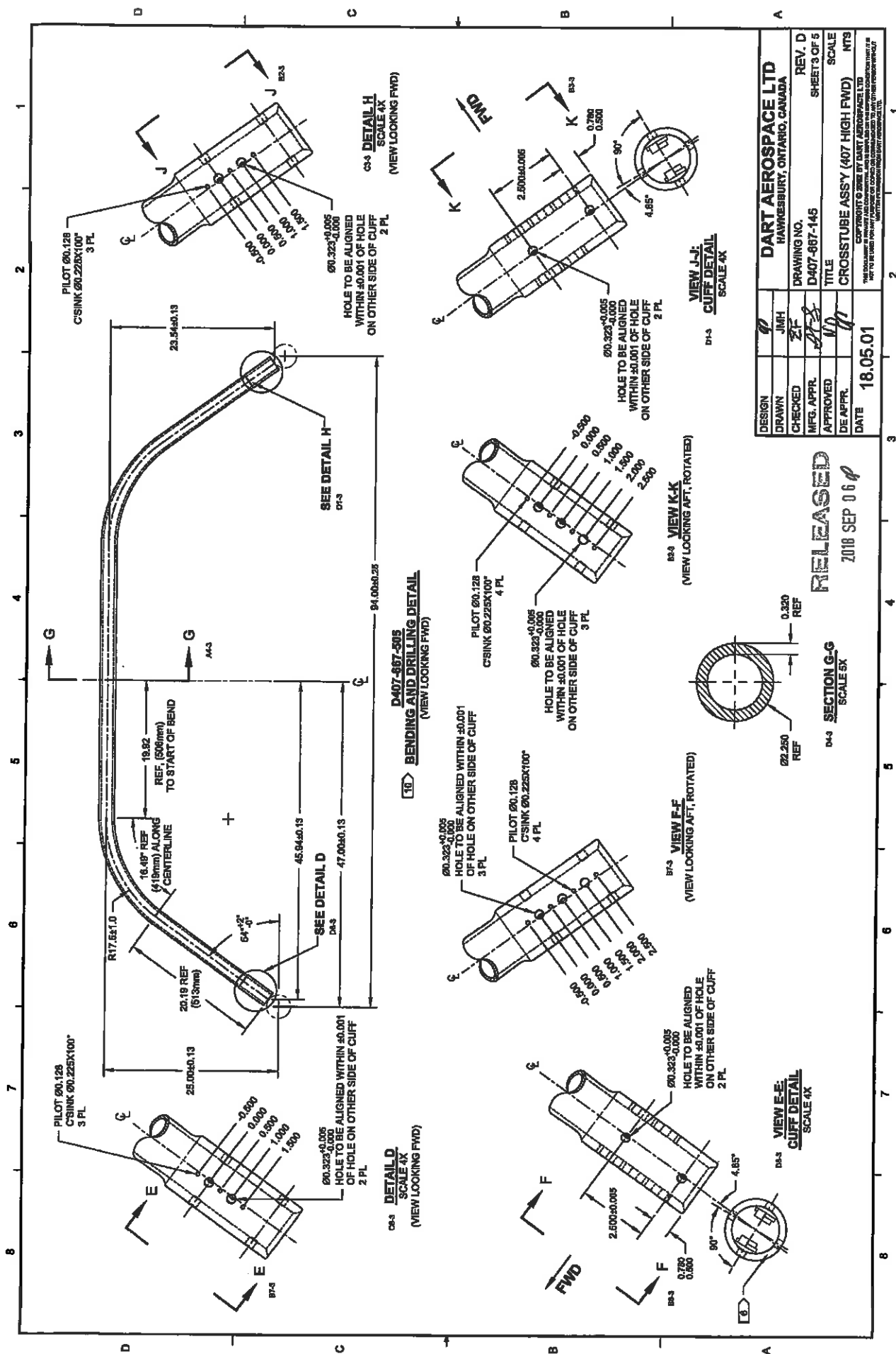
19-06-07

D	REVISE SHEET 2 ASSEMBLY DETAIL HOLE PATTERN PER CAR18-221. UPDATE PARTS LIST AND GENERAL NOTES 12 & 15 TO INCORPORATE DEC C-1. ADD ITEMS 10-14 TO PARTS LIST, ADD GENERAL NOTES 18-19 AND ADD SHEET 5 TO INCORPORATE DEC C-2.	JMH	18.05.01
C	REVISE GENERAL NOTES PART LIST (2N D7-1); REORGANIZED VIEWS AND REFORMATTED DRAWING TO MEET STANDARDS. D3595-063-395 WAS D2891-100-684 (2N D3-2 & A5-2); REMOVED REF: 7 ADD TOLERANCES (2N C4-3, C4-3); RELOCATED FLAG #6 (2N A6-3) PER MCR 210; MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4.	RF	08.11.06
B	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHTMA SKUDTUBES	PH	05.07.28
A	NEW ISSUE	CP	02.06.08
REV.	DESCRIPTION	BY	DATE
DESIGN	JMH		
DRAWN			
CHECKED	JMH		
MFG. APPR.	278		
APPROVED	No		
DE APPR.			
DATE	18.05.01		

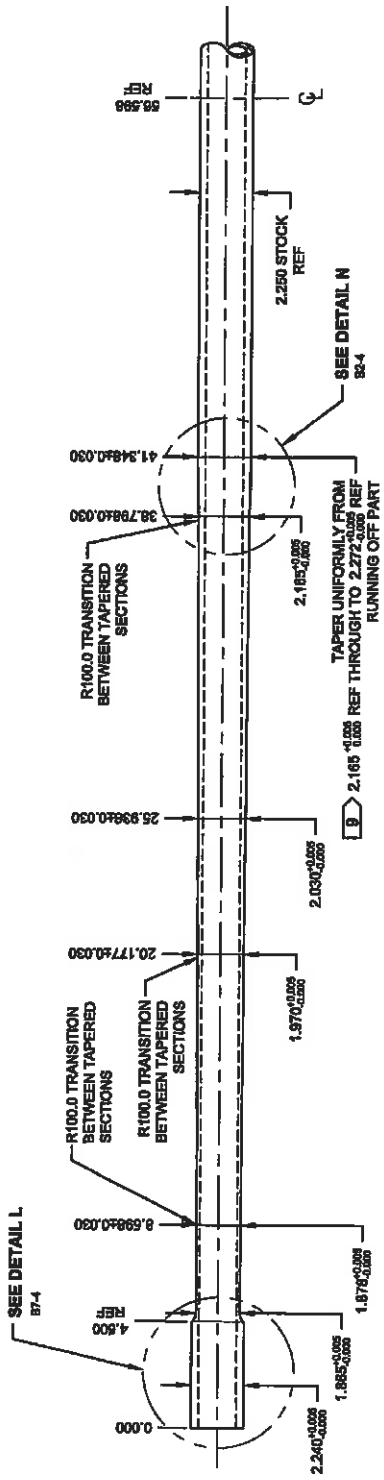
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2018-09-06

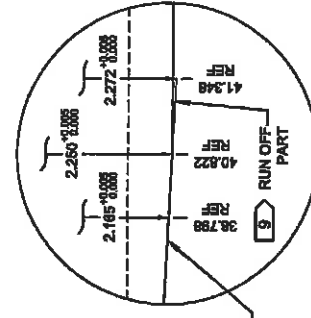
DART AEROSPACE LTD HAMKESBURY, ONTARIO, CANADA	REV. D
DRAWING NO. D407-667-145	SHEET 1 OF 5
TITLE CROSSTUBE ASSY (407 HIGH FWD)	SCALE
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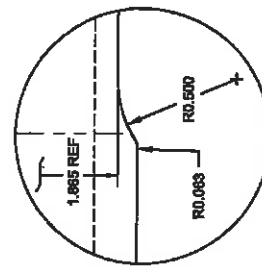
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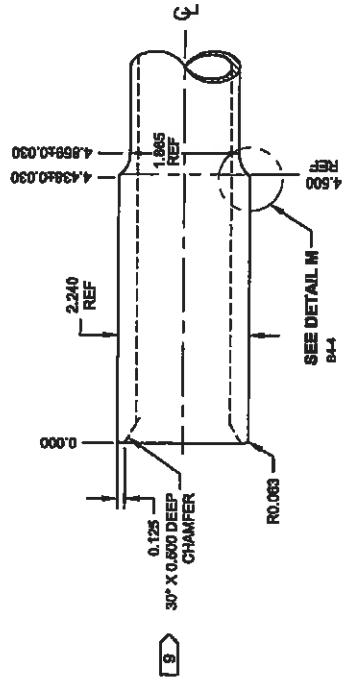
TURNING DETAIL



DETAIL N:
TAPER RUN-OFF
NOT TO SCALE



DETAIL M:
CUFF TRANSITION
NOT TO SCALE

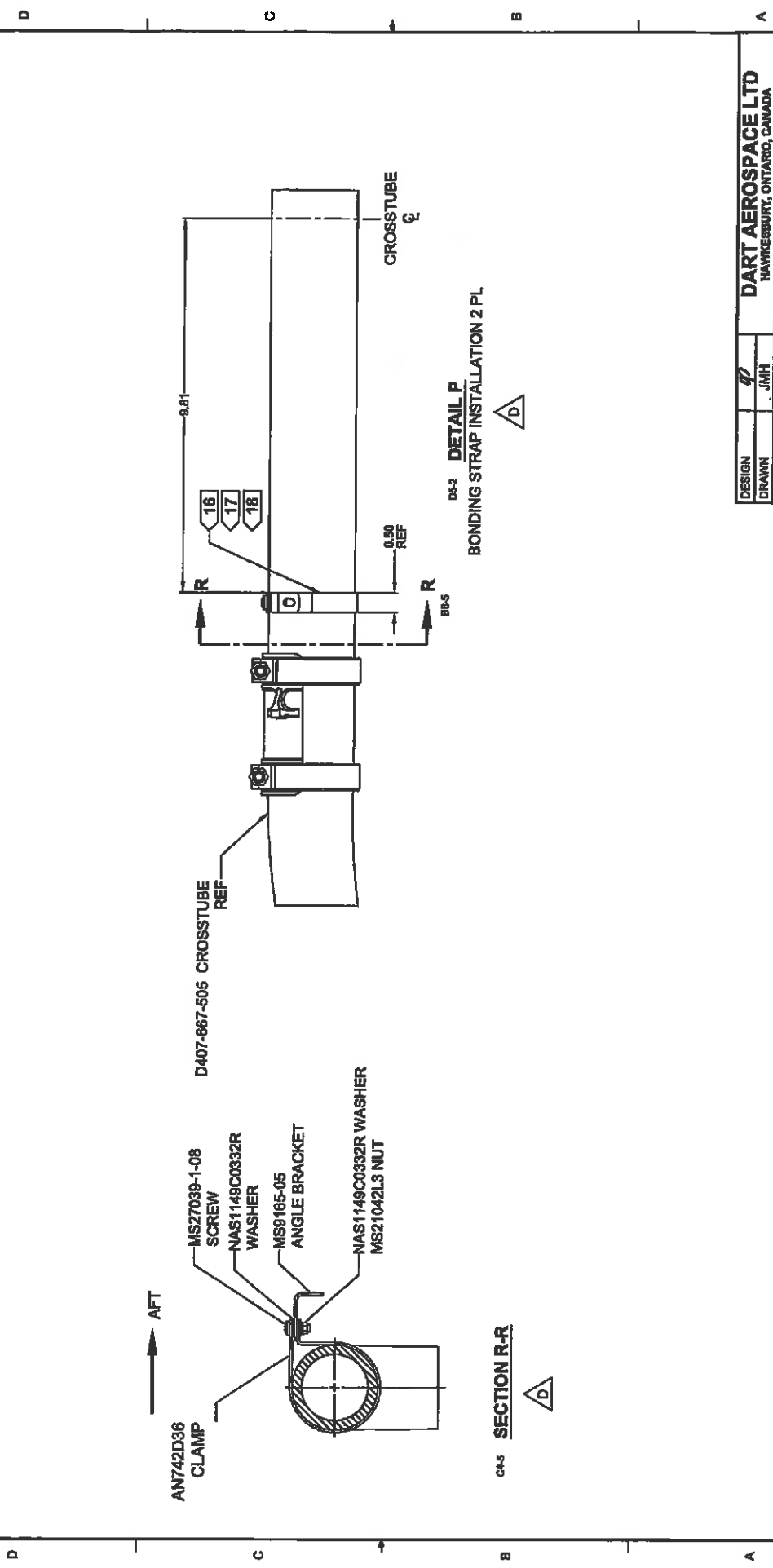


DETAIL L:
CROSS-TUBE CUFF
NOT TO SCALE

DESIGN	00	DART AEROSPACE LTD
DRAWN	JMH	HAWKESBURY, ONTARIO, CANADA
CHECKED	ZF	DRAWING NO.
MFG. APPR.	44-8	D407-887-145
APPROVED	110	TITLE
DATE	18.05.01	CROSSTUBE ASSY (407 HIGH FWD)
REV. D	SHEET 4 OF 5	SCALE
NTS		

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2018 SEP 06

1 2 3 4 5 6 7 8



D5-2 DETAIL P
BONDING STRAP INSTALLATION 2 PL



C4-5 SECTION R-R



DESIGN	0	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA
DRAWN	JMH	
CHECKED	ZF	DRAWING NO.
MFG. APPR.	AF	D407-667-145
APPROVED	00	TITLE
DE APPR.	00	CROSSTUBE ASSY (407 HIGH FWD)
DATE	18.05.01	SCALE
		NTS

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REV. D
SHEET 6 OF 5
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Entered: _____ Date: _____

WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

Route update only

NCR No. _____

DISPOSITION		DEPARTMENT/PROCESS				MRB (QS1042)	
Job: _____	Rework ☐	Skid-tube ☐	Cross tube ☐	Eng. (Non-AW) ☐	Engineering ☐		
Part No. _____	Scrap ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Water Jet ☐		
	Use-as-is ☐	Large Fab ☐	Finishing ☐	Rec/Store/Packaging ☐	Supplier ☐		
					Quality ☐		
Date: _____		Sequence #: _____		QTY Affected: _____			
Description Work Order Deviation		Disposition					
						Completed By	
						Lead hand / Supervisor	
						QC / QA Coordinator	
Root Cause		FAULT CATEGORY					
Operator ☐	Pressure/Forced ☐	Contamination ☐	Power Loss/Surge ☐	Positioned Wrong ☐			
Manufacturing Process ☐	Bending ☐	Misaligned/off center ☐	Folio/Program ☐	Outside Tolerance ☐			
Equip/Tooling ☐	Crushing ☐	BOM/Route ☐	Grain Direction ☐	Drawing ☐			
Handling/Preservation ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Finish ☐			
Material ☐	Crimp/Kink/Ripple/Wave/Twist ☐	Incomplete/Unclear Instructions ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐			
Product Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Out of Sequence ☐	Misread ☐			
Process Improvement ☐	Mislabeled ☐	Fit/Function ☐	Off-set/Set-up ☐				
Human Factors ☐	Other/Details: _____						